

The diagram illustrates an engine control system. On the left, input signals **Tw**, **Qa**, **TVO**, **Ne**, and **Toil** are connected to the **ECCS C/U** (1) unit. The **ECCS C/U** (1) outputs **SVTC** to the **18 VTC HYDRAULIC PRESSURE CONTROL VALVE**, which is connected to the **17 VTC MECHANISM**. The **ECCS C/U** (1) also outputs **SAFR** and **Sig** to the **11 VVL HYDRAULIC PRESSURE CONTROL VALVE**, which is connected to the **13 VVL MECHANISM**. The **13 VVL MECHANISM** is connected to the **14 CAMSHAFT**, which has components **14a** and **14b**. The **14 CAMSHAFT** is connected to the **16 VALVE LIFTER** and the **15 ENGINE VALVE**. The **16 VALVE LIFTER** is connected to the **17 VTC MECHANISM**. The **17 VTC MECHANISM** is connected to the **12 OIL SUPPLY LINE**. The **12 OIL SUPPLY LINE** is connected to the **21 PVL PRESSURE SENSOR** and the **20 CAM-ANGLE SENSOR**. The **20 CAM-ANGLE SENSOR** outputs **CAM-ANGLE SENSOR SIG.** to the **ECCS C/U** (1). The **21 PVL PRESSURE SENSOR** outputs **PVVL** to the **11 VVL HYDRAULIC PRESSURE CONTROL VALVE**.

FIG.2

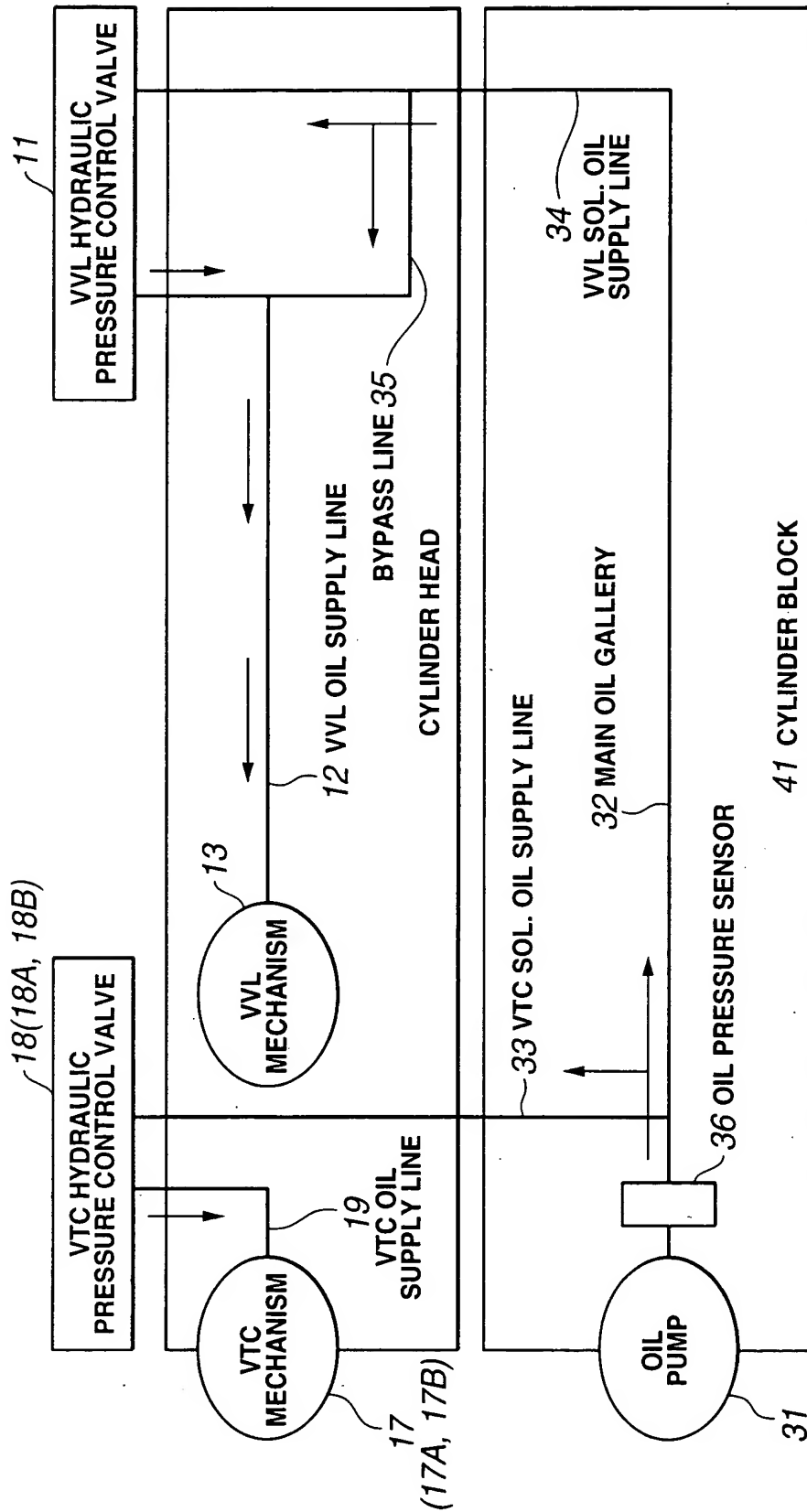


FIG.3

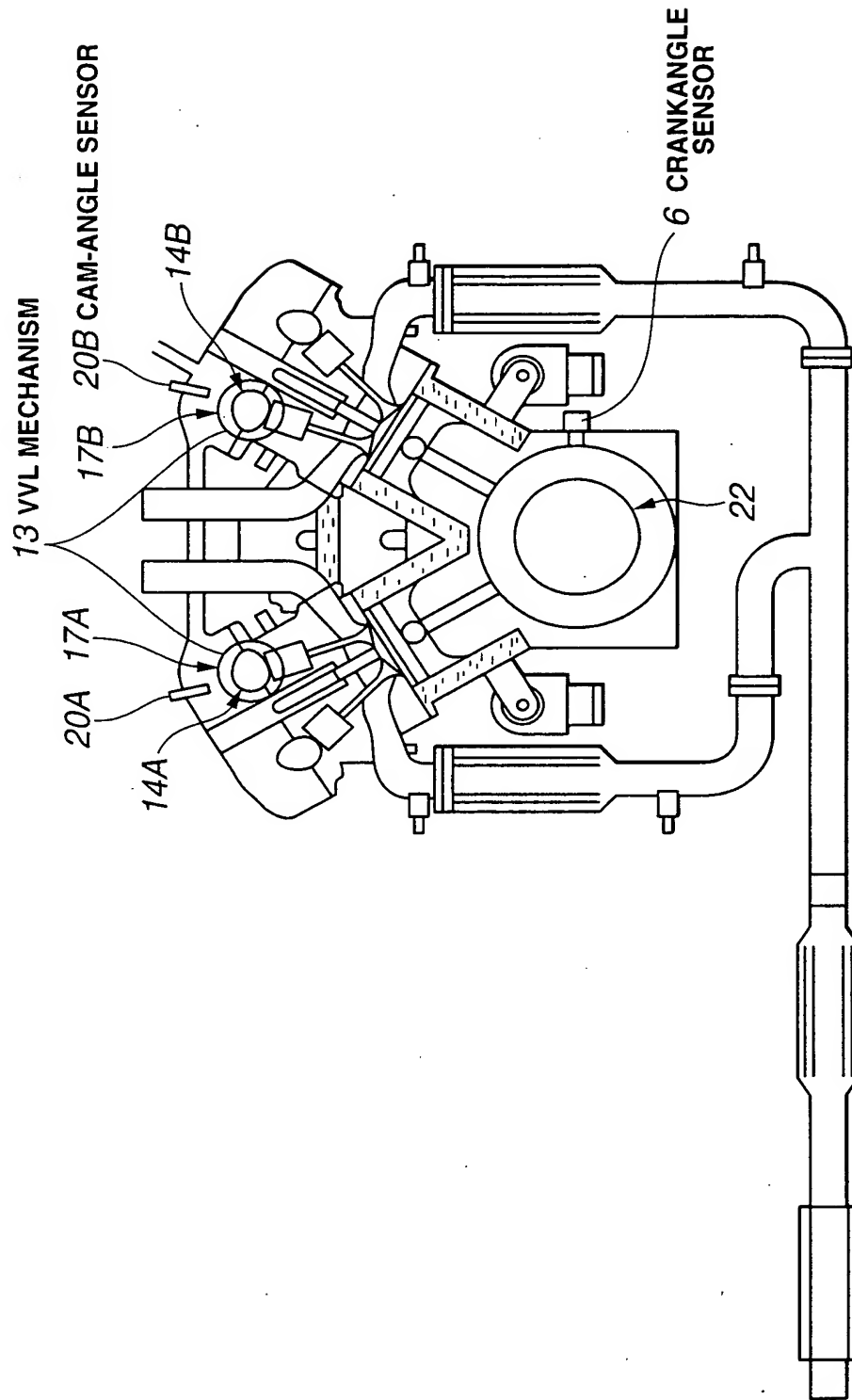
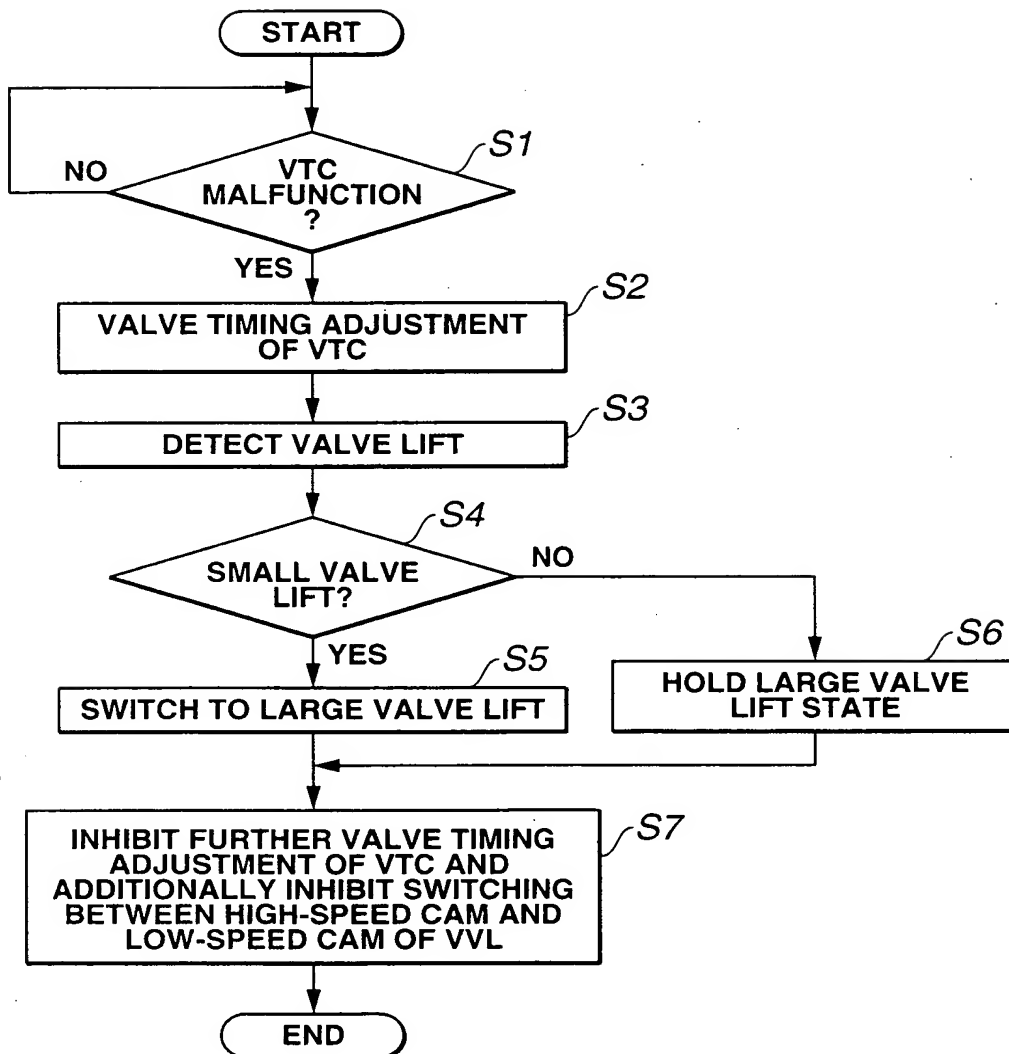


FIG.4



**FIG. 5A**



**FIG. 5B**

## VTC 17A CAM-ANGLE SENSOR SIG.

**NORMAL STATE**

**FIG. 5C**

**VTC 17B CAM-ANGLE  
SENSOR SIG.**

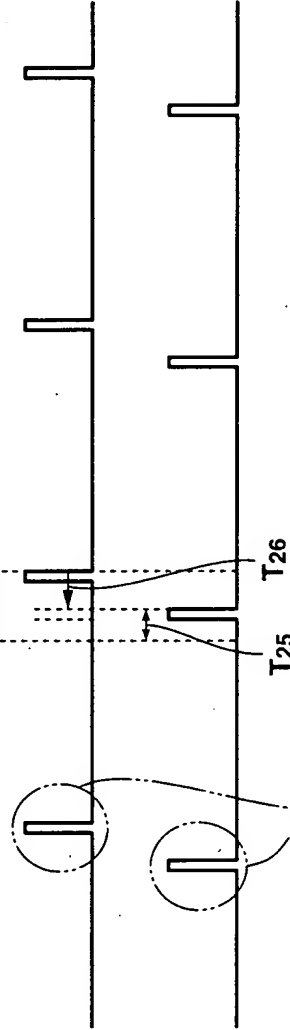
**FIG. 5D**

**VTC 17A CAM-ANGLE  
SENSOR SIG.**

**ABNORMAL STATE  
(MALFUNCTION OF VTC)**

**FIG. 5E**

**VTC 17B CAM-ANGLE  
SENSOR SIG.**



## ASYNCHRONOUS CAM-ANGLE SENSOR SIG. OUTPUTS

FIG.6A

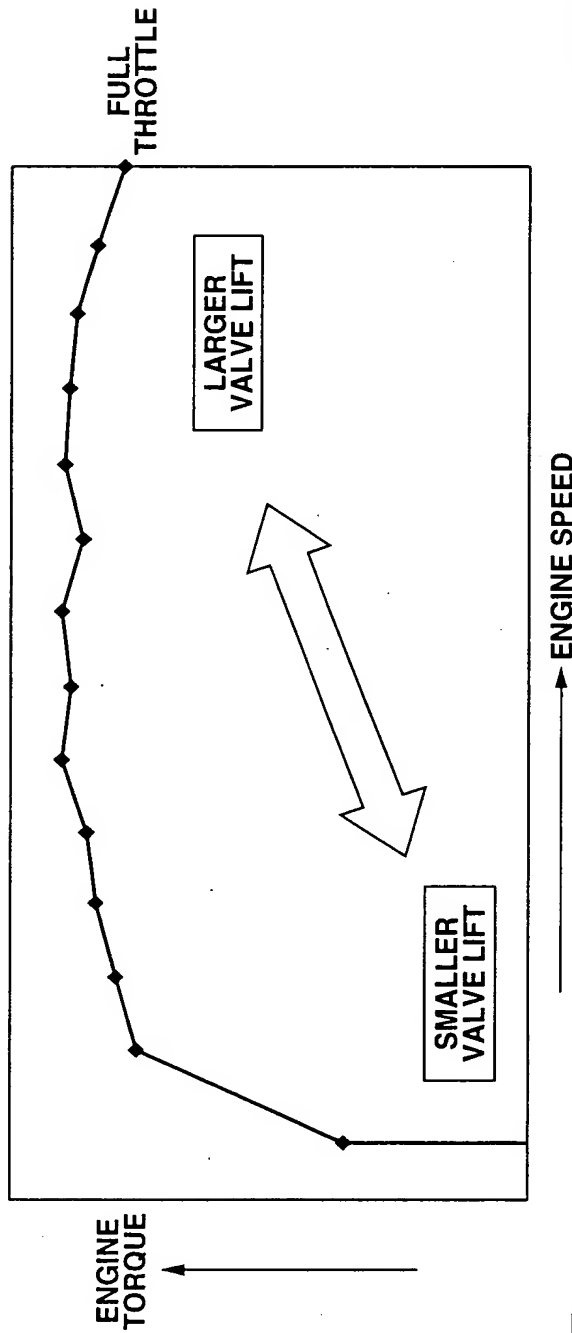


FIG.6B

SMALL-VALVE-LIFT PERIOD  
ENGINE OPERATION ENABLING RANGE R1

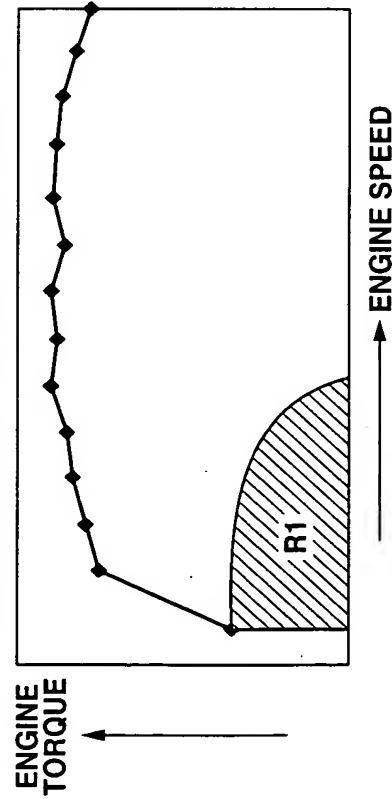


FIG.6C

LARGE-VALVE-LIFT PERIOD  
ENGINE OPERATION ENABLING RANGE R2

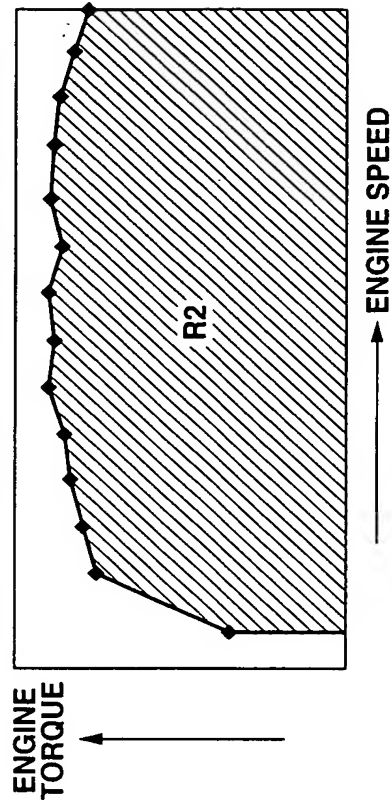


FIG.7

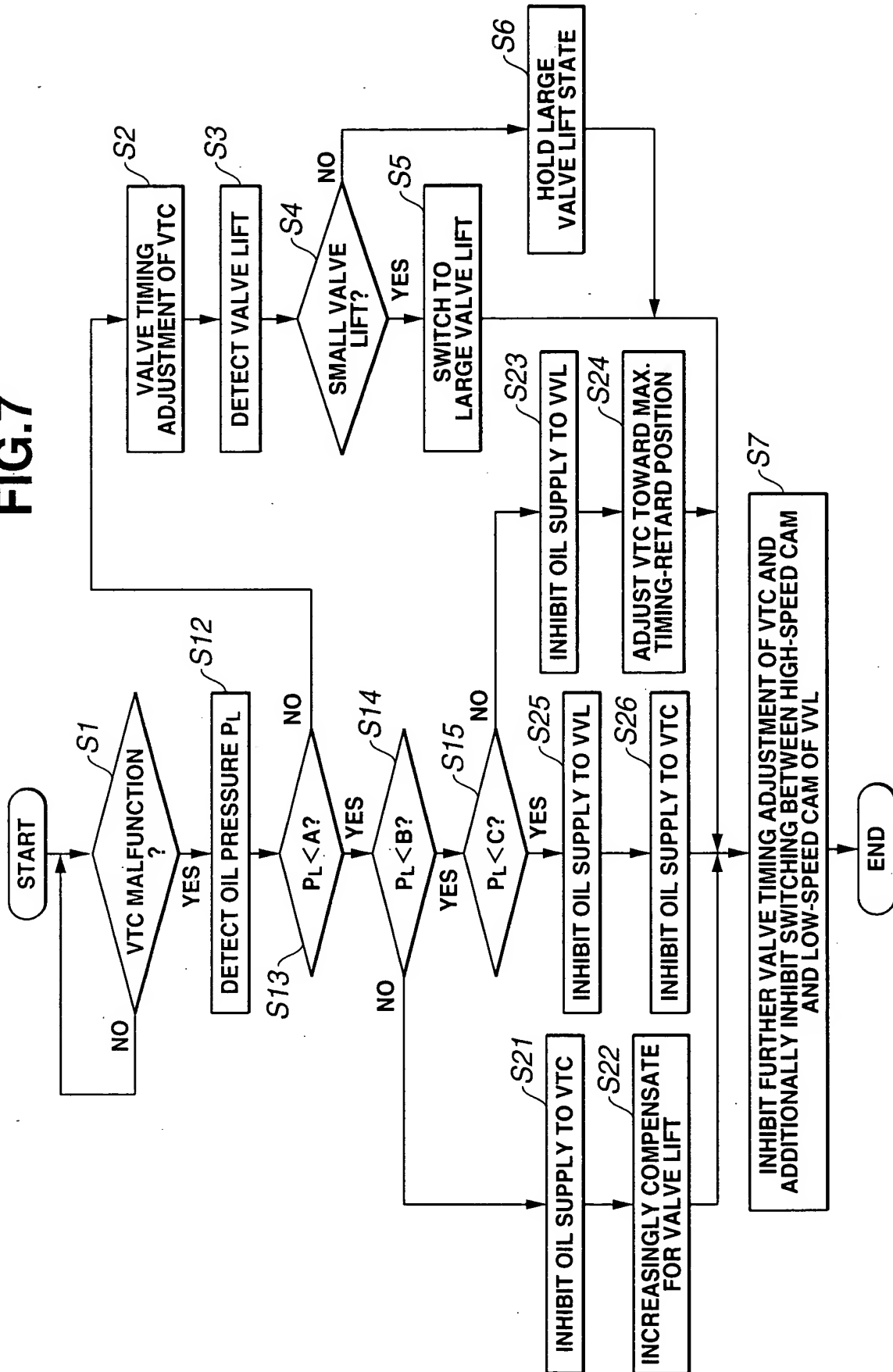


FIG.8

